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22 February 2011

Mr. Richard T. Von Pein, P.E.
Waste Management
9081 Tujunga Avenue
Sun Valley, CA 91352

RE: Waimanalo Gulch Landfill
Evaluation of Hydraulic Head Below Liner System - Findings

Dear Mr. Von Pein:

As requested by Waste Management of Hawaii, Inc. (WMH), Geosyntec Consultants, Inc. (Geosyntec) has reviewed the field work performed by AECOM in general accordance with the *Work Plan for Evaluating Hydraulic Head Below Liner System*[1] prepared by Geosyntec to evaluate the possibility of excess pressure below the liner system in areas of Cell E6 where water ponded after the storms in December 2010 and January 2011. The Work Plan and field work are required elements of the "Work" pursuant to Section 19.e of the Administrative Order on Consent for Removal Action, CERCLA Docket No. 09-20111-0007/RCRA Docket No. 7003-09-2011-0001.

To evaluate hydraulic head below the liner, AECOM drilled two borings on 5 February 2011 (PZ-5 and PZ-6) and 1 boring (PZ-1) on 15 February 2011. AECOM collected depth to water measurements and found that the borings were dry. Based on the dry conditions encountered by AECOM in the borings at the proposed locations for PZ-1, PZ-5, and PZ-6, it can be concluded that no excess hydraulic head exists below the liner in the areas of Cell E6 where water ponded in December 2010 and January 2011. AECOM's documentation is included as Appendix A to this letter.

Please contact us if there are further questions.

Sincerely yours,

Hari D. Sharma

Hari D. Sharma, Ph.D., P.E.
Principal

[1] *Work Plan for Evaluating Hydraulic Head Below Liner System*, prepared by Geosyntec Consultants, Inc. for Waste Management of Hawaii, Inc., 31 January 2011.

Geosyntec consultants

ATTACHMENT

Appendix A – AECOM Report (21 February 2011)

COPY TO

Mr. Joseph Whelan (WMH)
Mr. Jesse Frey (WMH)

APPENDIX A

AECOM REPORT (21 FEBRUARY 2011)

AECOM
1001 Bishop Street, Suite 1600
Honolulu, Hawaii 96813-3698
www.aecom.com

808 523 8874 tel
808 523 8950 fax

February 21, 2011

Waste Management of Hawaii
Waimanalo Gulch Sanitary Landfill
92-460 Farrington Highway
Kapolei, Hawaii 96707

Attention: Mr. Jesse Frey
Subject: **Waimanalo Gulch Sanitary Landfill (WGSL)**
Evaluation of Hydraulic Head Below Liner System Summary Report

Dear Mr. Frey:

This letter report summarizes the advancement of three (3) boreholes to evaluate hydraulic conditions beneath the Cell E6 liner system, performed for Waste Management of Hawaii, Inc. (WMH) at the Waimanalo Gulch Sanitary Landfill (WGSL) on February 5 and 15, 2011. AECOM provided oversight and documentation during drilling in accordance with the *Waimanalo Gulch Landfill Work Plan for Evaluating Hydraulic Head Below Liner System* ("the Work Plan") (Geosyntec, January 31, 2011) and Section 19.e of the Administrative Order On Consent for Removal Action, CERCLA Docket No. 09-20111-0007/RCRA Docket No. 7003-09-2011-0001.

Prior to drilling, WMH surveyed the proposed borehole locations to ensure the borings were located outside the limits of the landfill liner. The locations were marked in the field with wooden stakes. Figure 1, provided by WMH, shows the approximate locations of the boreholes which are labeled PZ-1, PZ-5, and PZ-6. Drilling activities were performed by Blasting Technologies, Inc. All three (3) boreholes were advanced using a hydraulic top hammer rock drilling rig equipped with a 4-inch diameter drill bit.

On February 5, 2011, borings PZ-5 and PZ-6 were advanced through a 10 to 12 feet thick layer of 3-inch minus basaltic backfill material, penetrating into the underlying basalt bedrock to total depths of 27.0 (PZ-5) and 26.5 (PZ-6) feet below the ground surface (bgs). Boring PZ-1 was advanced through basalt bedrock to a total depth of 28 feet bgs on February 15, 2011. Completion depths for all boreholes were approximately six (6) feet below the bottom of the Cell E6 liner system. Borehole lithologies were documented based on rock cuttings generated during drilling; however, cuttings consisted of mainly pulverized rock powder. Visual rock descriptions are annotated on the attached Borehole Logs (Attachment 1).

No saturated conditions were encountered during drilling. Depth to water (DTW) measurements collected from each of the borings immediately following drilling indicated that all of the borings were dry. Following initial measurements, five (5) feet of 2-inch diameter polyvinyl chloride (PVC) well screen and 25 feet of 2-inch diameter PVC well casing were placed in each of the borings to keep them from collapsing, and after approximately one hour, the DTW levels were remeasured. The second set of measurements confirmed that all of the borings were dry; therefore, per the Work Plan, the borings were not converted to piezometers. All PVC casing and screen material was removed from the boreholes and all borings were abandoned with bentonite.

Should you have any questions or comments regarding this letter report, please call me at (808) 356-5341.

Very truly yours,

Pete LaPlaca, Geologist

Enclosures: Figure 1: Borehole Locations
Attachment 1: Borehole Logs

cc: Jesse Frey, Waste Management of Hawaii Inc.
Justin Lottig, Waste Management of Hawaii Inc.

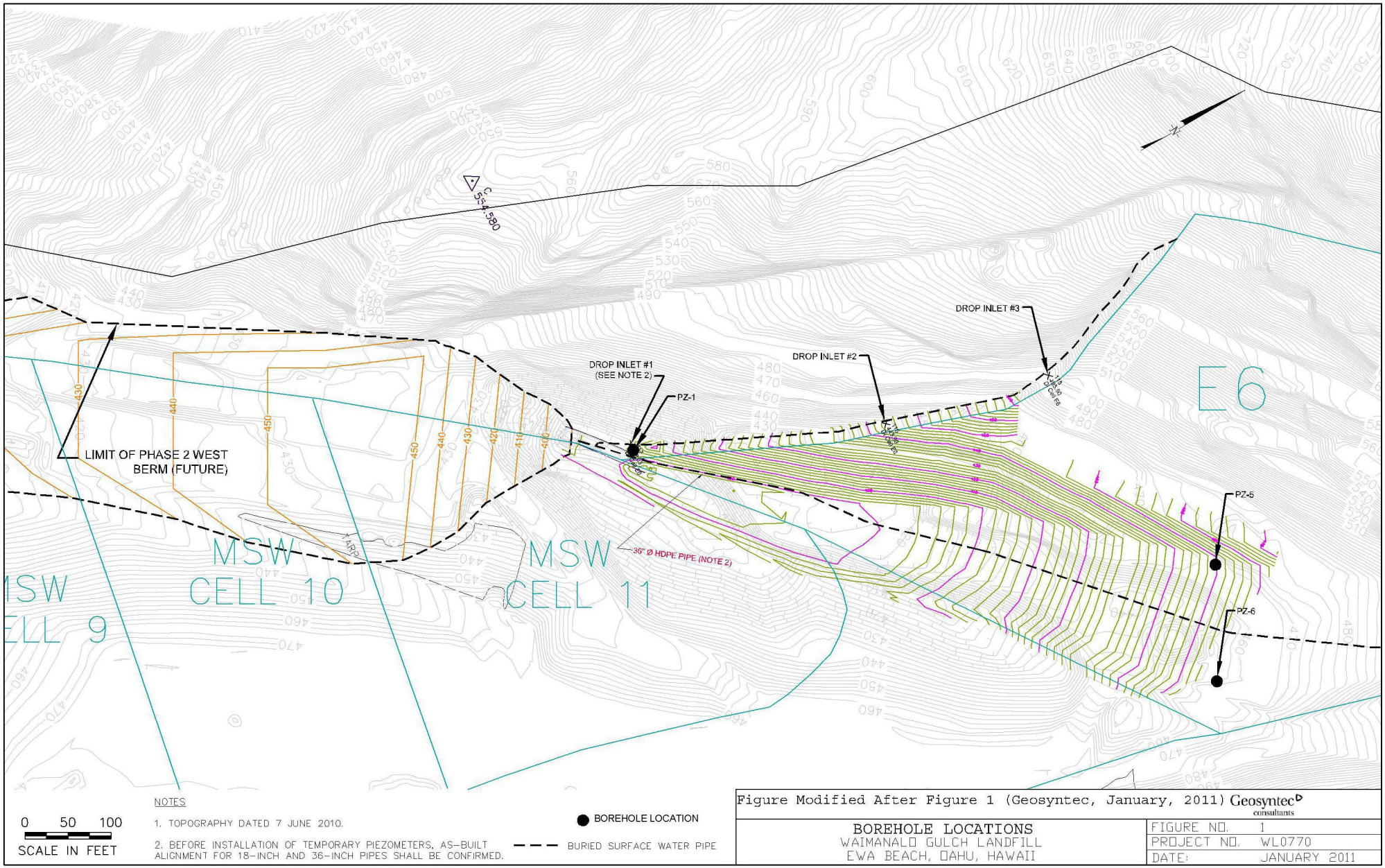

Figure Modified After Figure 1 (Geosyntec, January, 2011) Geosyntec consultants

BOREHOLE LOCATIONS
WAIMANALO GULCH LANDFILL
EWA BEACH, OAHU, HAWAII

FIGURE NO.	1
PROJECT NO.	WL0770
DATE:	JANUARY 2011

WMH001426

Borehole Log

Project Name: WGSL Temporary Piezometers		Project Number: 60191709	**Borehole Number: PZ-1**
Borehole Location: Waimanalo Gulch Sanitary Landfill		*Northing:* 70558.365 *Easting:* 458451.94	Sheet *1* of *1*
Drilling Agency: Blasting Technologies Inc.		Driller: Steve Jankanish	
Drilling Equipment: Sandvik DX800		Depth to Water (feet): N/A	Total Depth (feet): 28.0
Drilling Method: Hydraulic Rock Drill		Date & Time Started: 2/15/2011, 8:20:00 AM	Date & Time Finished: 2/15/2011, 8:40:00 AM
Size and Type of Bit: 4 inch Button Bit	Borehole Diameter (in): 4 inch	Elevation: 413.8 ft. msl	Sample Type: N/A
		Logged By: P. LaPlaca	Checked By: S. Sahetapy-Engel

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Analytical Samples & ID	Estimated %: Gravel	Estimated %: Sand	Estimated %: Fines	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Remarks
1–28										BASALT	Basalt, medium hardness, Munsell 7.5 YR 5/1 (gray), dry. Very small rock cuttings (< 2mm diameter) and rock powder.	

CTO 105 NISMO BORELOG\WGSL TEMPORARY PIEZOMETERS.GPJFORD.GDT2/16/11

WMH001427

Borehole Log

Project Name: WGSL Temporary Piezometers		Project Number: 60191709	**Borehole Number: PZ-5**
Borehole Location: Waimanalo Gulch Sanitary Landfill		*Northing:* 71070.581 *Easting:* 459008.002	Sheet *1* of *1*
Drilling Agency: Blasting Technologies Inc.		Driller: Steve Jankanish	
Drilling Equipment: Sandvik DX800		Depth to Water (feet): N/A	Total Depth (feet): 27.0
Drilling Method: Hydraulic Rock Drill		Date & Time Started: 2/5/2011, 7:25:00 AM	Date & Time Finished: 2/5/2011, 7:45:00 AM
Size and Type of Bit: 4 inch Button Bit	Borehole Diameter (in): 4 inch	Elevation: 464.6 ft. msl	Sample Type: N/A
		Logged By: P. LaPlaca	Checked By: S. Sahetapy-Engel

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recover	Samples: Analytical Samples & ID	Estimated %: Gravel	Estimated %: Sand	Estimated %: Fines	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Remarks
1–10	N/A					60	10	30		GC	Sandy clayey basaltic gravel (3 inch minus backfill material), Munsell 5 YR 4/4 (dark reddish brown) clay and 7.5 YR 5/1 (gray) gravel, moist.	
10–27										Basalt	Basalt, medium hardness, Munsell 7.5 YR 5/1 (gray), dry. Very small rock cuttings (< 2mm diameter) and rock powder.	

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WMH001428

Borehole Log

Project Name: WGSL Temporary Piezometers		Project Number: 60191709	**Borehole Number: PZ-6**
Borehole Location: Waimanalo Gulch Sanitary Landfill		*Northing:* 70980.185 *Easting:* 459058.173	Sheet *1* of *1*
Drilling Agency: Blasting Technologies Inc.		Driller: Steve Jankanish	
Drilling Equipment: Sandvik DX800		Depth to Water (feet): N/A	Total Depth (feet): 26.5
Drilling Method: Hydraulic Rock Drill		Date & Time Started: 2/5/2011, 6:55:00 AM	Date & Time Finished: 2/5/2011, 7:15 AM
Size and Type of Bit: 4 inch Button Bit	Borehole Diameter (in): 4 inch	Elevation: 459.4 ft. msl	Sample Type: N/A
		Logged By: P. LaPlaca	Checked By: S. Sahetapy-Engel

Depth (feet)	Samples: Number	Samples: Type	Samples: Blow Count	Samples: Percent Recovery	Samples: Analytical Samples & ID	Estimated %: Gravel	Estimated %: Sand	Estimated %: Fines	Log: Graphic	Log: USCS or Rock Type	Lithologic Description	Remarks
1–12	N/A					60	10	30		GC	Sandy clayey basaltic gravel (3 inch minus backfill material), Munsell 5 YR 4/4 (dark reddish brown) clay and 7.5 YR 5/1 (gray) gravel, moist.	
12–27										Basalt	Basalt, medium hardness, Munsell 7.5 YR 5/1 (gray), dry. Very small rock cuttings (< 2mm diameter) and rock powder.	

CTO 105 NISMO BORELOG\WGSL TEMPORARY PIEZOMETERS.GPJFORD.GDT2/16/11

WMH001429